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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PIZIALI, ANDREW T

ART UNIT	PAPER NUMBER
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1771

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/506,318

Applicant(s)

ECHIGO ET AL.

Examiner

Andrew T. Piziali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13, 14, 16-26 and 28-70 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13, 14, 16-26 and 28-70 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed on 8/18/2005 has been entered.

Claim Rejections - 35 USC § 102/103

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 13-14, 16-24, 37, 39-50, 63, 65, 67 and 69 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over USPN 6,030,575 to Barron et al. (hereinafter referred to as Barron).

Regarding claims 13-14, 16-24, 37, 39-50, 63, 65, 67 and 69, Barron discloses a prepreg comprising a short fiber nonwoven fabric comprising thermal-resistant synthetic fibers, an inorganic binder, and a resin varnish wherein the prepreg is manufactured by bonding the synthetic fibers by coating with the inorganic binder and after the bonding impregnating the nonwoven fabric with a resin varnish wherein the thermal-resistant synthetic fibers intersect each

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other forming intersections wherein the thermal-resistant synthetic fibers are bound with the inorganic binder at the intersections (see entire document including column 4, lines 30-37, column 5, lines 1-10 and 36-62 and column 10, lines 3-35). Barron discloses that the prepreg may be cured or cooled as needed (column 10, lines 3-35). Barron specifically discloses that the prepreg may be semi-cured (see Example 3).

Regarding the prepreg being a circuit board prepreg, the limitation fails to further limit the structure of the prepreg. Therefore, it appears that the prepreg taught by the applied prior art can be considered a circuit board prepreg.

Regarding the binder having a higher softening temperature than that of the resin varnish, Barron discloses that the binder is not suppose to degrade under temperature conditions encountered during subsequent molding operations and that the preform is suppose to maintain its physical integrity during subsequent molding operations (column 4, lines 25-29, column 5, lines 1-10, and column 6, lines 45-65). In addition, Barron discloses that filler particles can be bound to the fibers by the binder thus eliminating the problem of the particles falling out of the perform when the resin is injected during composite formation (column 9, lines 51-59). Barron is clearly disclosing that the binder does not soften during semi-curing because otherwise the filler particles would fall out of the preform.

Regarding the binder surrounding the fibers, Barron discloses “the filler can be applied evenly to the fibers and bound to them by the binder material” (see column 9, lines 41-59). Barron also discloses “although thermoplastic polymers can be used as the resin...they usually have viscosities that are too high for easy processing...The high viscosity of the thermoplastic polymers often causes them to flow very poorly around the fibers in the perform” (see column

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10, lines 3-26). Therefore, Barron appears to disclose that the binder is suppose to surround the fibers at the intersections of the fibers and at portions of the fibers other than at intersections.

In the event that it is shown that Barron does not specifically discloses that the binder surrounds the fibers at the intersections of the fibers and at portions of the fibers other than at intersections, Barron does disclose that the binder can be selected from a wide variety of compositions with the understanding that the selection will affect the characteristics of the perform (column 4, lines 30-37). Barron discloses that it is known in the art that the viscosity of a binder may be decreased to result in a higher binding strength because a larger portion of the surface of the fibers becomes coated with the binder (column 2, lines 3-28). Barron also discloses that it is known in the art that the viscosity affects the compaction of the preform (paragraph bridging columns 6 and 7). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the viscosity of the binder to result in the desired fiber binding strength and the desired compaction, and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Regarding claims 14 and 40, Baron discloses that the resin varnish may be an epoxy resin, a phenol resin, or the like (column 10, lines 27-35).

Regarding claims 16 and 41, Baron discloses that the thermal-resistant synthetic fibers may be at least one kind of fibers such as aramid fibers or the like (column 5, lines 36-62).

Regarding claims 17-18, 37, 42-43 and 50, Baron discloses that the binder may be a low melting point glass (column 5, lines 1-10).

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Regarding claims 19 and 44, Baron discloses that the content of the inorganic binder may range from 0.25 to about 100 weight parts when the thermal-resistant synthetic fibers are 100 weight parts (column 6, lines 56-65).

Regarding claims 20 and 45, Baron discloses that the fibers may have a diameter in the range of about 1 to about 1000 microns (column 5, lines 35-62).

Regarding claims 21 and 46, Baron discloses that the fibers may have a length of about 0.1 (2.54 mm) to 18 inches (column 5, lines 35-62).

Regarding claims 22 and 47, Baron discloses that the prepreg may be formed by an air-directed method (paragraph bridging columns 5 and 6), but does not specifically mention a wet formation method. It is the examiner's position that the article of the applied prior art is identical to the claimed article. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The burden has been shifted to the applicant to show obvious difference between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289 (Fed. Cir. 1983). The applied prior art either anticipated or strongly suggested the claimed subject matter. It is noted that if the applicant intends to rely on Examples in the specification or in a submitted declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with the applied prior art.

Regarding claims 23 and 48, Baron discloses that the weight of the prepreg may range from about 0.1 to about 10 kg/m² (column 6, lines 11-25).

Regarding claims 24 and 49, Baron discloses that the average thickness of the prepreg may range up to about 1 inch (column 6, lines 11-25).

Regarding claims 63 and 65, Baron discloses that the inorganic binder coats the intersections of the short fibers and the remaining areas of the fibers (see entire document including column 3, lines 27-30 and column 9, lines 41-59).

Regarding claims 67 and 69, Barron discloses that the binder may have a melting point of less than about 700°C, preferably from about 100 to about 500°C (column 5, lines 1-10).

Claim Rejections - 35 USC § 103

5. Claims 22, 25-26, 28-36, 38, 47, 51-62, 64, 66, 68 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,030,575 to Barron as applied to claims 13-14, 16-24, 37, 39-50, 63, 65, 67 and 69 above, and further in view of EP 0 807 703 to Sakai et al. (hereinafter referred to as Sakai).

Regarding claims 22, 34, 47 and 59, although it is the examiner's position that the article of the applied prior art is identical to the claimed article (see above), in the event that it is shown that the article made by the method of Barron is not identical to the claimed article the following is submitted: Baron does not limit the production method for forming the nonwoven fabric. Sakai discloses that it is known in the art to use a wet formation method to obtain a nonwoven fabric (see entire document including page 2, lines 43-47). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the nonwoven fabric from any suitable formation method, such as a wet formation method, as taught by Sakai,

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because it is within the general skill of a worker in the art to select a known production process on the basis of its suitability.

Regarding claims 25-26, 28-36, 38, 51-62, 64, 66, 68 and 70, Baron does not specifically mention the use of the prepreg as an insulator in a circuit board, but Sakai discloses that it is known to use such a prepreg as an insulator in a circuit board (see entire document including page 2, lines 3-6). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the prepreg of Baron an insulator in a circuit board, as taught by Sakai, because the prepreg of Baron is simple to construct (column 2, lines 59-63) while possessing the characteristics desired as an insulator in a circuit board.

Regarding claims 26 and 52, Baron discloses that the resin varnish may be an epoxy resin, a phenol resin, or the like (column 10, lines 27-35).

Regarding claims 28 and 53, Baron discloses that the thermal-resistant synthetic fibers may be at least one kind of fibers such as aramid fibers or the like (column 5, lines 36-62).

Regarding claims 29-30, 38, 54-55 and 62, Baron discloses that the binder may be a low melting point glass (column 5, lines 1-10).

Regarding claims 31 and 56, Baron discloses that the content of the inorganic binder may range from 0.25 to about 100 weight parts when the thermal-resistant synthetic fibers are 100 weight parts (column 6, lines 56-65).

Regarding claims 32 and 57, Baron discloses that the fibers may have a diameter in the range of about 1 to about 1000 microns (column 5, lines 35-62).

Regarding claims 33 and 58, Baron discloses that the fibers may have a length of about 0.1 (2.54 mm) to 18 inches (column 5, lines 35-62).

Regarding claims 35 and 60, Baron discloses that the weight of the prepreg may range from about 0.1 to about 10 kg/m² (column 6, lines 11-25).

Regarding claims 36 and 61, Baron discloses that the average thickness of the prepreg may range up to about 1 inch (column 6, lines 11-25).

Regarding claims 64 and 66, Baron discloses that the inorganic binder coats the intersections of the short fibers and the remaining areas of the fibers (see entire document including column 3, lines 27-30 and column 9, lines 41-59).

Regarding claims 68 and 70, Barron discloses that the binder may have a melting point of less than about 700°C, preferably from about 100 to about 500°C (column 5, lines 1-10).

6. Claims 13-14, 16-24, 37, 39-50, 63, 65, 67 and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,030,575 to Barron in view of Applicant's Disclosure.

Regarding claims 13-14, 16-24, 37, 39-50, 63, 65, 67 and 69, Barron discloses a prepreg comprising a short fiber nonwoven fabric comprising thermal-resistant synthetic fibers, an inorganic binder, and a resin varnish wherein the prepreg is manufactured by bonding the synthetic fibers by coating with the inorganic binder and after the bonding impregnating the nonwoven fabric with a resin varnish wherein the thermal-resistant synthetic fibers intersect each other forming intersections wherein the thermal-resistant synthetic fibers are bound with the inorganic binder at the intersections (see entire document including column 4, lines 30-37, column 5, lines 1-10 and 36-62 and column 10, lines 3-35).

Regarding the prepreg being a circuit board prepreg, the limitation fails to further limit the structure of the prepreg. Therefore, it appears that the prepreg taught by the applied prior art can be considered a circuit board prepreg.

Regarding the binder having a higher softening temperature than that of the resin varnish, Barron discloses that the binder is not suppose to degrade under temperature conditions encountered during subsequent molding operations and that the preform is suppose to maintain its physical integrity during subsequent molding operations (column 4, lines 25-29, column 5, lines 1-10, and column 6, lines 45-65). In addition, Barron discloses that filler particles can be bound to the fibers by the binder thus eliminating the problem of the particles falling out of the perform when the resin is injected during composite formation (column 9, lines 51-59). Barron is clearly disclosing that the binder does not soften during semi-curing because otherwise the filler particles would fall out of the preform.

Regarding the binder surrounding the fibers, Barron discloses “the filler can be applied evenly to the fibers and bound to them by the binder material” (see column 9, lines 41-59). Barron also discloses “although thermoplastic polymers can be used as the resin...they usually have viscosities that are too high for easy processing...The high viscosity of the thermoplastic polymers often causes them to flow very poorly around the fibers in the perform” (see column 10, lines 3-26). Therefore, Barron appears to disclose that the binder is suppose to surround the fibers at the intersections of the fibers and at portions of the fibers other than at intersections.

In the event that it is shown that Barron does not specifically discloses that the binder surrounds the fibers at the intersections of the fibers and at portions of the fibers other than at intersections, Barron does disclose that the binder can be selected from a wide variety of compositions with the understanding that the selection will affect the characteristics of the perform (column 4, lines 30-37). Barron discloses that it is known in the art that the viscosity of a binder may be decreased to result in a higher binding strength because a larger portion of the

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surface of the fibers becomes coated with the binder (column 2, lines 3-28). Barron also discloses that it is known in the art that the viscosity affects the compaction of the preform (paragraph bridging columns 6 and 7). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the viscosity of the binder to result in the desired fiber binding strength and the desired compaction, and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

It is the examiner's position that Baron specifically discloses that the prepreg may be semi-cured (see Example 3), but in the event that it is shown that Barron fails to teach semi-curing the prepreg, it would have been obvious to one having ordinary skill in the art at the time the invention was made to semi-cure the prepreg of Barron, because the applicant discloses that it is known in the art to semi-cure a prepreg in order to deal with problems such as poor processability (see page 2, lines 6-13).

Regarding claims 14 and 40, Baron discloses that the resin varnish may be an epoxy resin, a phenol resin, or the like (column 10, lines 27-35).

Regarding claims 16 and 41, Baron discloses that the thermal-resistant synthetic fibers may be at least one kind of fibers such as aramid fibers or the like (column 5, lines 36-62).

Regarding claims 17-18, 37, 42-43 and 50, Baron discloses that the binder may be a low melting point glass (column 5, lines 1-10).

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Regarding claims 22 and 47, Baron discloses that the prepreg may be formed by an air-directed method (paragraph bridging columns 5 and 6), but does not specifically mention a wet formation method. It is the examiner's position that the article of the applied prior art is identical to the claimed article. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The burden has been shifted to the applicant to show obvious difference between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289 (Fed. Cir. 1983). The applied prior art either anticipated or strongly suggested the claimed subject matter. It is noted that if the applicant intends to rely on Examples in the specification or in a submitted declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with the applied prior art.

Regarding claims 23 and 48, Baron discloses that the weight of the prepreg may range from about 0.1 to about 10 kg/m² (column 6, lines 11-25).

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Regarding claims 24 and 49, Baron discloses that the average thickness of the prepreg may range up to about 1 inch (column 6, lines 11-25).

Regarding claims 63 and 65, Baron discloses that the inorganic binder coats the intersections of the short fibers and the remaining areas of the fibers (see entire document including column 3, lines 27-30 and column 9, lines 41-59).

Regarding claims 67 and 69, Barron discloses that the binder may have a melting point of less than about 700°C, preferably from about 100 to about 500°C (column 5, lines 1-10).

7. Claims 22, 25-26, 28-36, 38, 47, 51-62, 64, 66, 68 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,030,575 to Barron in view of Applicant's Disclosure as applied to claims 13-14, 16-24, 37, 39-50, 63, 65, 67 and 69 above, and further in view of EP 0 807 703 to Sakai.

Regarding claims 22, 34, 47 and 59, although it is the examiner's position that the article of the applied prior art is identical to the claimed article (see above), in the event that it is shown that the article made by the method of Barron is not identical to the claimed article the following is submitted: Baron does not limit the production method for forming the nonwoven fabric. Sakai discloses that it is known in the art to use a wet formation method to obtain a nonwoven fabric (see entire document including page 2, lines 43-47). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the nonwoven fabric from any suitable formation method, such as a wet formation method, as taught by Sakai, because it is within the general skill of a worker in the art to select a known production process on the basis of its suitability.

Regarding claims 25-26, 28-36, 38, 51-62, 64, 66, 68 and 70, Baron does not specifically mention the use of the prepreg as an insulator in a circuit board, but Sakai discloses that it is known to use such a prepreg as an insulator in a circuit board (see entire document including page 2, lines 3-6). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the prepreg of Baron as an insulator in a circuit board, as taught by Sakai, because the prepreg of Baron is simple to construct (column 2, lines 59-63) while possessing the characteristics desired as an insulator in a circuit board.

Regarding claims 26 and 52, Baron discloses that the resin varnish may be an epoxy resin, a phenol resin, or the like (column 10, lines 27-35).

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Regarding claims 68 and 70, Barron discloses that the binder may have a melting point of less than about 700°C, preferably from about 100 to about 500°C (column 5, lines 1-10).

Response to Arguments

8. Applicant's arguments filed 8/18/2005 have been fully considered but they are not persuasive.

The applicant asserts that the core teaching of Barron is to use a binder that releases during the molding steps. The examiner respectfully disagrees. Barron discloses that the binder is not suppose to degrade under temperature conditions encountered during subsequent molding operations and that the preform is suppose to maintain its physical integrity during subsequent molding operations (column 4, lines 25-29, column 5, lines 1-10, and column 6, lines 45-65). In addition, Barron discloses that filler particles can be bound to the fibers by the binder thus eliminating the problem of the particles falling out of the perform when the resin is injected during composite formation (column 9, lines 51-59). Barron is clearly disclosing that the binder does not soften during semi-curing because otherwise the filler particles would fall out of the preform.

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Conclusion

9. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Piziali whose telephone number is (571) 272-1541. The examiner can normally be reached on Monday-Friday (8:00-4:30).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

atp

g2j 9/15/05
ANDREW T. PIZALI
PATENT EXAMINER


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